

CONCENTRIC RINGS CONFIGURATION

December 6, 2005

PURPOSE OF CONFIGURATION

The purpose of this configuration is to preserve and expand existing shoreline habitat at the Salton Sea. Two concentric water bodies or rings would be constructed. Shoreline habitat would be preserved and expanded in the proposed rings, and the rings would also provide open water habitat that would eventually be lost due to decreased inflows and increasing salinity. Air quality management would also be included for exposed playa that may be emissive.

DESCRIPTION OF CONFIGURATION AND FACILITIES NEEDED

The Concentric Rings Configuration includes the following major features:

- ❖ **First Perimeter Ring:** This outer or First Perimeter Ring would consist of a brackish waterbody approximately 10 feet deep, with a target salinity between 20,000 and 30,000 milligrams per liter (mg/L). To form the ring, a dike would be constructed around the Sea along the -240 foot mean sea level (msl) contour, and a stable shoreline would be maintained at a target elevation of -230 feet msl. This elevation would preserve the existing shoreline habitat around the Sea. Additional habitat features such as islands, snags, and deep water holes (up to 15 feet deep) would be included in the ring. This ring would also provide connectivity between drains that discharge to the Sea for desert pupfish. Water in the First Perimeter Ring would be circulated to provide an acceptable salinity gradient throughout the water body.
- ❖ **Second Perimeter Ring:** This inner or Second Perimeter Ring would consist of a marine waterbody approximately 10 feet deep, with a target salinity between 35,000 and 40,000 mg/L. To form the ring, a dike would be constructed around the Sea along the -250 foot msl contour, and a stable shoreline would be maintained at a target elevation of -240 feet msl. This elevation would create additional shoreline habitat around the Sea. Similar to the First Perimeter Ring, additional habitat features would be included in this ring, and water would be circulated.
- ❖ **Brine Sink:** The Brine Sink would provide the “outlet” necessary to manage the elevation and salinity in the rings. The Brine Sink would expand and contract seasonally depending on seasonal inflows.
- ❖ **Air Quality Management Area:** Excavated canals would be constructed around the Sea near the Second Perimeter Ring to provide desilted, brackish water for managed vegetation in the Air Quality Management areas. (*See Air Quality Management Summary Sheet for more information*).

- ❖ **Water Quality Management:** Water treatment plants may be needed to remove nutrients and selenium from inflows for water supplied to First and Second Perimeter Rings.

HOW THE CONFIGURATION WORKS

- ❖ A portion of the water from the New and Alamo Rivers is captured and discharged into the First Perimeter Ring. The quantity of water is balanced to maintain a salinity of at least 20,000 mg/L, on average, throughout this ring. Excess water is routed to the Second Perimeter Ring or to the Brine Sink.
- ❖ Water from the Whitewater River flows into the First Perimeter Ring.
- ❖ Water from the First Perimeter Ring is discharged into the Second Perimeter Ring. The quantity of water in the Second Perimeter Ring is balanced to maintain a salinity of about 35,000 mg/L on average throughout this ring. Excess water is routed to the Brine Sink.
- ❖ Water in each ring is circulated in a clockwise direction to promote mixing and to maintain salinity targets in each ring. A pumping station within each ring (located near Bombay Beach) will provide the circulation needed.
- ❖ The Second Perimeter Ring would be constructed when the Sea recedes enough to allow its placement.
- ❖ As the Sea continues to recede, and the rings are completed, playa below the Second Perimeter Ring will be exposed. Desilted water from the New and Alamo Rivers will be conveyed to this area for the air quality management needs. This water will be blended with water from the rings to irrigate vegetation on exposed playa that may be emissive.
- ❖ Canals and other conveyance facilities are designed to carry water to the air quality management and created habitat areas.

Main Characteristics After 75 Years:

Based on inflows of 650,000 acre-feet and elevation target of -230 feet msl

First Perimeter Ring:

- ❖ Salinity: About 20,000 mg/L
- ❖ Surface area: 30,000 acres
- ❖ Perimeter dike located at -240 msl

Second Perimeter Ring:

- ❖ Salinity: About 35,000 mg/L
- ❖ Surface area: 36,000 acres
- ❖ Perimeter dike located at -250 msl

Perimeter Dikes:

- ❖ Volume: 60.8 million cubic yards

Brine Sink:

- ❖ Salinity: much greater than 200,000 mg/L
- ❖ Elevation: -265 to -275 feet msl
- ❖ Surface area: 22,000 acres

Air Quality Management:

- ❖ Total area of exposed playa 144,000 acres
- ❖ Area with irrigated vegetation 72,000 acres (50 percent of total area)

Estimated Capital Cost: \$7.9 billion

WHAT HAPPENS IF AVERAGE ANNUAL INFLOWS ARE GREATER THAN 650,000 ACRE-FEET?

The additional inflow water could allow for the construction of additional concentric rings or be conveyed to the Brine Sink. If the additional inflows are conveyed to the Brine Sink, the size of the Brine Sink would increase. The larger Brine Sink or more concentric rings will reduce the amount of exposed playa and the amount of air quality management area.

CAN THE NUMBER OR COMPLEXITY OF FACILITIES BE REDUCED?

The complexity of this configuration is due, in part, to maintaining target salinities in each of the rings. This is critical to supporting habitats and is not likely to be left unmonitored or adjusted. The future Second Perimeter Ring and air quality management areas could be changed if conditions or needs are different than expected.

The additional canals and infrastructure to support the air quality management may be simplified in the future. If the exposed playa is not emissive, the need for irrigated vegetation or other dust controls would be reduced.

This configuration could be simplified by eliminating water treatment plants. Upstream controls of nutrients and selenium may reduce the need for water treatment.

If the First and Second Perimeter Rings were shallower, the perimeter dike construction could be simplified and risk of failure could be less.

